

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF INTERNAL AFFAIRS
James F. Woodward, Secretary

BUREAU OF TOPOGRAPHIC AND GEOLOGICAL SURVEY
George H. Ashley, State Geologist

COAL BEDS IN GREENE COUNTY, PENNSYLVANIA

By

J. D. Sisler

Introduction.

Greene County has more unmined coal than any other county in Pennsylvania and is estimated to contain one-fourth of the reserves of the Pittsburgh coal in the State. So far extensive coal mining has been limited to the Monongahela River district where the Pittsburgh coal outcrops. The important coals, with the exception of the Waynesburg bed, have no outcrops in the county west of Monongahela River, and lie at great depth. Since the more easily accessible coal along the river is rapidly being worked out, shaft mining has started in other parts of the county. Drilling for oil and gas has shown several other coals below the Pittsburgh bed but their identity is uncertain and it is impossible at present to estimate their tonnage. Their development will be delayed because of their great depth.

In 1918 Greene County stood thirteenth among the counties in Pennsylvania producing bituminous coal, with an output of 1,269,425 tons, valued at \$3,309,377. Of this quantity 1,098,505 tons were loaded at the mine for shipment; 30,265 tons were sold to local trade and used by employees; 32,311 tons were used at the mines for steam and heat; 108,353 tons valued at \$254,630 were made into coke at the mines. The Pittsburgh coal furnished most of this output and also practically all the coke.

Greene County has at least eight workable coals. The Pittsburgh coal is the only one that can be worked over large areas; the others are workable only locally, because they are for the most part too thin and dirty to be commercially valuable. Thirty beds are known in the county. They range from a few inches to 6 feet thick, but

average less than 1 foot. Their total thickness would approximate 25 feet.

Greene County forms the southwestern corner of the State. It is bounded on the north by Washington County; on the east by Fayette County and on the south and west by West Virginia. Its maximum length is 32 miles, its maximum width 19 miles, and its area is 590.4 square miles. Its 1920 population was 30,804.

The river district, from which most of the production comes, has ample transportation facilities. The Monongahela division of the Pennsylvania railroad follows the valley of Monongahela River south from Pittsburgh, and carries coal both north and south. The Monongahela with its locks offers another means of transportation to Pittsburgh and points to the south. The central and western parts of the county are not well served by railroads. The Wheeling coal railroad enters the county from West Virginia at the state line near the northern county line and follows that line a few miles and then enters Washington County. The Waynesburg and Washington railroad runs between Washington and Waynesburg. The Morgantown and Wheeling railroad, which connects with the Monongahela division of the Pennsylvania railroad at a point north of Morgantown, West Virginia, opens up a small district in the southern part of the county.

In the absence of railroads, much coal is hauled over the highways for local and domestic use. These highways are mostly dirt roads and are good in summer but nearly impassable in winter.


The county is decidedly hilly. It is a thoroughly dissected region with a relief of about 800 feet. The elevations range from 860 to 1600 feet. Narrow ridges and rounded knobs with steep slopes at their base are characteristic. The streams have entrenched themselves in narrow valleys with rather steep slopes. Terraces and benches occur along the larger tributaries, particularly in the eastern portion of the county.

STRUCTURE.

Greene County is crossed in a general northeast-southwest direction by a number of anticlines and synclines forming a series of waves which, from east to west, are as follows: Lambert syncline, Brownsville anticline, Whiteley syncline, Bellevernon anticline, Waynesburg syncline, Amity anticline, Nineveh syncline, and Washington anticline. They reach their highest point, 750 feet above sea, on the Brownsville anticline near Willow Tree and their lowest point on the Nineveh syncline, in which the Pittsburgh coal is only 100 feet above sea level and more than 1,000 feet below the surface.

The bottom of the Pittsburgh coal was used as a datum plane for drawing the structure contours.

The Lambert syncline begins at Willow Tree and extends northeast across Monongahela River. The Pittsburgh coal is 450 feet above tide



Digitized by the Internet Archive
in 2016 with funding from

This project is made possible by a grant from the Institute of Museum and Library Services as administered by the Pennsylvania Department of Education through the Office of Commonwealth Libraries

at its deepest point in the syncline. The slopes are gentle on both flanks of the basin.

The rocks rising to the west form an irregular arch, the Brownsville anticline. This structure is irregular and not well defined in Greene County.

The Whiteley syncline, lying to the west of the Brownsville anticline is another minor structure. Its slopes are very gentle and its bottom wide and shallow, tending to deepen to the south.

The Bellevernon anticline, with its axis running through the town of that name, and extending to the southeastern part of Greene County, is a pronounced and an important structural feature. Where the anticline crosses the Monongahela at Charleston, the Pittsburgh coal is 1,000 feet above sea level. Both slopes of the anticline are gentle.

The Waynesburg syncline is an unimportant structural feature lying west of the Bellevernon anticline.

The Amity anticline is the next structure to the west. It tails out soon after entering the county and its flanks are not well defined. The elevation of the Pittsburgh coal on the axis varies between 420 and 460 feet above sea.

The Nineveh syncline, which lies to the west of the Amity anticline, is one of the deepest in the Appalachian coal basin, and has a well defined axis. The southeastern slope of the syncline is irregular and the steepest dips are in the vicinity of the town of Nineveh. Further to the south the dips are gentle. On the western flank the rocks rise abruptly to the Washington anticline.

The Washington anticline crosses the extreme northwest part of the county. The dips are steep on the southeastern flank, averaging about 100 feet per mile, with the exception of that part lying between Graysville and Bristoria, where the dip locally increases to 250 feet per mile. A roughly triangular dome has its center near Jacksonville. Further north the axis rises again.

STRATIGRAPHY.

Greene County is geologically the highest point in the western part of the State because it contains higher beds in the Greene formation than any other county. The Greene and Washington formations of Permian age and the Monongahela formation of the Pennsylvanian series of the Carboniferous constitute the outcropping bedrocks. Deposits of gravels, clays and sand of Quaternary age occupy the valley bottoms. The Greene formation covers large areas in the county and is chiefly composed of easily weathered sandstones and shales. The upper part of the formation has been removed by erosion. That which remains is about 800 feet thick. The Washington formation which lies beneath it has not undergone much erosion. It is composed chiefly of sandstones, shales and coals and has a maximum thickness of 400 feet.

The Monongahela formation, which varies in thickness from 270 to 400 feet, remains almost wholly intact throughout the county. It contains shales and sandstones, over 100 feet of limestone, and five coal beds which are locally workable. The lower formations are known only from drill records and little definite knowledge is to be had concerning their character.

COALS.

Greene County contains the coals highest in the Carboniferous system in Pennsylvania. Thirteen coals outcrop in the county, of which eight are locally workable and the others are thin and unimportant. A coal bed that lies between 625 and 720 feet below the Pittsburgh coal and has been encountered in many drill holes, is tentatively correlated with the Upper Freeport coal which, in eastern Washington County is 600 feet below the Pittsburgh coal.

Pittsburgh Coal. The Pittsburgh coal outcrops along the valley of Monongahela River and its tributaries in the eastern part of the county. It outcrops along Ten Mile Creek nearly up to Waynesburg; up Muddy Creek for four miles and up Whiteley Creek for eight miles from the river. The Pittsburgh coal is probably workable everywhere in Greene County but it doubtless varies in thickness. It has good coking qualities and during recent years has been bought up by large iron companies as a reserve for the future production of coke.

This coal is characteristically a double bed, having a roof division separated from a lower division by a clay parting from $\frac{1}{4}$ inch to 3 feet thick. In the northern part of the county especially, a roof shale 8 to 12 inches thick comes in over the upper division of the bed. The roof division of the coal varies from 2 inches to 8 feet in thickness and is cut by many clay partings. The coal of the roof division is very high in ash and sulphur. The lower and mineable division of the bed varies from 3 inches to 9 feet in thickness, including three persistent partings. These thin partings separate the lower division into four distinct benches; the upper or "Breast", the "Bearing-in", the "Brick", and the "Lower Bottom". The "Breast" coal is generally the best and thickest part of the bed and in this county is free from any distinct impurities. The "Bearing-in" bench is usually 2 to 4 inches thick with a thin bone binder above and below it, and is so soft that the miners use it to bear in on the other coal to gain a working face. The coal is so soft that it mines out as slack. The "Brick" coal is so named because the cleavage planes tend to make it break and mine out in brick-shaped blocks. As a rule, the "Brick" coal is of excellent quality although locally it is impure and not mined. The "Lower Bottom" is the lowest bench of the lower division. It is generally very impure and carries numerous shale partings. In places, however, a few inches at the top is good clean coal and is mined with the "Brick" coal.

The roof division of the Pittsburgh bed thickens and the lower division thins to the north. The characteristic binders are everywhere present. In Dunkard, Monongahela and Jefferson townships the exposures of the Pittsburgh coal show a thin top division and a

9 foot lower division. In southern Greene County near the State line this coal measures 7 feet with $\frac{1}{2}$ inch of slate 6 inches above the bottom. On Dunkard Creek the bed is 11 feet thick with a clay parting 8 inches above the bottom. At Greensboro the roof and main clays are each 1 foot thick; the lower division of the coal is 9 feet thick with benches of 6, 1 and 2 feet. The partings are very thin. The coal appears to be thinnest at the mouth of Cheat River.

Redstone Coal. This bed which lies 50 feet above the Pittsburgh coal is persistent in the county but rarely is mineable, its average thickness being less than 18 inches. Its horizon is often marked by black shale carrying a few inches of coal. Along Monongahela River the bed is represented by 13 feet of bituminous shale, while in the districts back from the river the bed is a few inches of clean coal.

Sewickley Coal. The few outcrops of the Sewickley coal are confined to the eastern part of the county where it is mined chiefly in the vicinity of Mapletown, hence its local name, the Mapletown coal. In this locality the coal varies from 4 inches to 5 feet 6 inches in thickness. At Grays Landing the bed is in two 2 foot benches separated by 1 foot of shale. At Hartleys Mills the coal is thicker than at Grays Landing, but is cut by many clay partings. The top and middle benches are fair coal, but the lower bench is dirty and carries much sulphur. Below Clarksville on Ten Mile Creek the coal is 12 to 20 inches thick and carries 1 to 3 partings. The coal makes its best showing at Mapletown; where it is divided into three benches of 2 feet 3 inches, 4 inches, and 2 feet 6 inches, parted by clay binders 1 to 2 feet thick. It lies about 120 feet above the Pittsburgh coal.

Uniontown Coal. This bed, lying from 60 to 90 feet below the Waynesburg coal, is not mined because it rarely exceeds 1 foot in thickness. Its blossom is persistent, but in many places the horizon is marked by bituminous shale.

Waynesburg Coal. The most important bed above the Pittsburgh is the Waynesburg coal. It is the main source of domestic fuel in many localities yet the quantity mined is small in comparison with the output of Pittsburgh coal in the county. Its position 400 feet above the Pittsburgh coal makes the outcrop more widespread and accessible, for it extends up South Fork of Tenmile Creek toward Waynesburg, up Whiteley Creek, and along Dunkard Creek and Meadow Run. In the Eastern part of the county the Waynesburg coal is 5 to 9 feet thick. In most localities it is a double bed. The upper bench varies from 1 to 3 feet and the lower bench is from 2 feet 6 inches to 4 feet in thickness. The benches are separated by a clay and shale parting having a thickness of 3 inches to 2 feet 4 inches. The coal is hard, but contains a large percentage of ash and sulphur. On Tenmile Creek the bed is 4 feet 11 inches thick, of which 1 foot 5 inches is clay. At Jefferson it has a thickness of 7 feet 8 inches, with two clay partings totalling 1 foot 6 inches. At Clarksville it is 6 feet 4 inches, with two clay partings of 5 and 14 inches. On Big Whiteley Creek the bed is 4 feet 11 inches thick and carries two 2 inch clay partings.

The Waynesburg "A" and the little Washington coals are thin beds which are represented in most localities by a few feet of bituminous shale.

Washington Coal. This bed is the most persistent of the Dunkard coals and although it has small importance in Greene County where it rarely reaches mineable thickness, it is one of the important coals in Washington County. In Greene County it is much swollen by clay and bone partings and is irregular in thickness. Over large areas the bed is represented only by bituminous shale. This coal lies 140 to 180 feet above the Waynesburg coal.

Jollytown Coal. This bed is mined locally for domestic use in the Dunkard Creek region where it has a maximum thickness of 20 inches. Its average thickness is less than 1 foot. It outcrops in a number of places along the south fork of Tenmile Creek, on Browns Creek and on Overflowing Run.

There are several small coals in the upper part of the Greene formation that nowhere exceed a few inches in thickness and are not mined. They are of geologic interest only and are not described in this brief bulletin. They are, in ascending order, the Tenmile, Dunkard, Nineveh, and Windy Gap coals.

